

## Swaffham Prior Community Heat Project – Investment Case

To: Environment and Sustainability Committee

Meeting Date: 14<sup>th</sup> January 2021

From: Steve Cox, Executive Director, Place and Economy

Electoral division(s): Burwell, Swaffham Prior

Forward Plan ref: 2020/048

Key decision: Yes

Outcome: 100% carbon reduction for heating and hot water from 2022 for homes and local businesses connected to the Swaffham Prior Community Heat Project.

Recommendation: Members are asked to:

- a) Approve the investment case for the Swaffham Prior Community Heat Project as set out in section 2.4.
- b) Note the project risks set out in section 3.
- c) Support further work with Government to develop community carbon policy to reduce risk to the project (and future projects) as set out in paragraph 3.1.
- d) Approve capital expenditure as set out in paragraph 2.4.7 to cover state aid compliance for the Heat Network Improvement Project (HNIP) commercialisation funding.
- e) Delegate the decision to sign contracts with Bouygues to design, build, operate and maintain the Swaffham Prior Community Heat Project, once final costs and grants are confirmed, to the Executive Director of Place and Economy and Chief Finance Officer in consultation with the Chair of Environment and Sustainability Committee and the Green Investment Advisory Group.

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## 1. Background

- 1.1 In March 2017, the Council approved its Corporate Energy Strategy. The strategy includes a vision to help “build energy resilient communities through aligning the Council’s assets and the potential for energy generation with local needs”. A key objective of the strategy is to “work with all partners and the local community to identify and facilitate low carbon energy projects using the Council’s assets to bring benefits to all partners.”
- 1.2 The Council adopted a new corporate objective (in February 2020) to deliver net zero carbon emissions for Cambridgeshire by 2050 and approved its Climate Change and Environment Strategy (CCES) at Full Council in May 2020. This strategy includes mitigation of climate change, cutting carbon emissions and the use of the Council’s assets to generate clean energy.
- 1.3 The Swaffham Prior Community Land Trust (SPCLT) has been the driving force behind this community heat project. It approached the Council in December 2017, sharing a feasibility study it had commissioned and inviting the Council to partner in the project and use rural estate land on the edge of the village, earmarked in part for industrial development, to host a clean energy centre for the community to take it off oil and onto renewable energy.
- 1.4 The Swaffham Prior Community Heat Network (SPCHN) comprises an energy centre located in a County owned barn and farmland at Goodwin Farm, which includes a ground source heat pump, air source heat pump, solar PV and thermal storage. Connecting to the energy centre is a district heating network (underground pipes) that runs through the village connecting to homes and businesses. Heat is transferred from the heat network via a heat interface unit into existing homes’ hot water and heating systems. Existing oil boilers and tanks are disconnected. Please see diagrams explaining the project in Appendices A and B. To get a visual sense of the project please watch the link to a video describing the community heat project ([Link here to a video describing the community heat project](#)) and review the project website news ([Link here to review the project website news](#)).
- 1.5 The SPCHN is a ground-breaking project. It is a first of its kind at this scale in the UK, enabling homes of any age in the village to decarbonise their heating and hot water. It uses established technologies already in place in other countries and applies them to the UK and Cambridgeshire more specifically. It has compared standalone air or ground source heat pumps to community heat schemes and concludes that for Swaffham Prior, which has many older listed buildings, individual solutions for some of the older or poorly insulated properties cannot reach high enough temperatures to give the same level of comfort as that provided by current oil boilers whilst also operating efficiently. This project has been designed to deliver heat to homes at temperatures between 70-75 degrees which means existing radiators and pipework can be used and not replaced. The business model innovation is that homes can join the scheme at no cost before construction starts and is open for anyone in the village to join (providing homes are compatible). This removes the current major financial barrier to decarbonising heat for homeowners. Individual solutions generally require homeowners to pay upfront for changing to low carbon solutions and a risk to the Government delivering net zero by 2050. This project is already an inspiration to other communities both within Cambridgeshire and across the UK looking to decarbonise, a trend which looks set to continue.
- 1.6 The intended outcome of this report is to construct the SPCHN during 2021/22 (once any necessary listed building approvals have been granted by East Cambridgeshire District

Council) to decarbonise the heating and hot water for homes and buildings in the village of Swaffham Prior, saving 38,000 tonnes of carbon emissions by 2050 and providing a more cost effective and sustainable solution for residents and their homes.

## 2. Main Issues

2.1 Why have the Government and the Council invested in the Project development to date?

- 2.1.1 The government is committed to expanding the low carbon economy whilst also hitting national carbon budgets. To deliver net zero greenhouse gas emissions it is looking to cut carbon emissions from household and commercial heating systems during the 2020s. More than a million homes in England are not connected to the gas network and are currently reliant on oil or liquefied petroleum gas (LPG). It is the intention of Government (Clean Growth Strategy, April 2018) to phase out the installation of high carbon fossil fuel heating in new and existing off gas grid residential and other buildings (which are mostly in rural areas) during the 2020s.
- 2.1.2 Research undertaken in 2019 by Cambridge University Science and Policy Exchange (CUSPE) for the Council identified that approximately one quarter to a third of carbon emissions in Cambridgeshire come from domestic and commercial buildings demanding heat for hot water and space heating. The estimated 10,000 homes and businesses across Cambridgeshire dependent on oil for heating and hot water contribute to these emissions.
- 2.1.3 Government has a number of mechanisms for incentivising the development of heat network projects. It set up the Heat Network Delivery Unit (HNDU) to fund project development and share early stage project risk; the Renewable Heat Incentive (RHI) to provide income for new projects to support the development of business cases and, more recently, the Heat Network Investment Project (HNIP) to provide gap funding for projects to help build market knowledge. All of these incentives are currently required to build a business case for off-gas community retrofit projects but the aim is that as more projects are developed, supply chains established and templates for key transactions developed, the costs for heating schemes will reduce.
- 2.1.4 The development of the SPCHN has taken three years. The timetable has been largely driven by the need to access grants to undertake project development. Moving through the grant stages is generally contingent on delivering agreed outputs at each stage. This has added time to the development of the project, but hopefully future projects will benefit from the learning these outputs have delivered. Five rounds of grant funding have been secured for the Swaffham Prior Community Heat Project and these are set out in Appendix C with the key deliverables. These grants have developed knowledge and experience in the community, at Cambridgeshire County Council and within Government on how to design and develop community scale heat retrofit projects which have social value. This knowledge can now inform new government policy and funding regimes for community heat decarbonisation, as well as provide communities with a guide on how to design and deliver heat projects for the future including key legal issues, contract templates, engaging with communities and project governance. This guide will save Government and communities' time and money in developing their own schemes and speed up the decarbonisation of other off-gas communities across the UK.
- 2.1.5 Cambridgeshire County Council (CCC) has match funded the major grants from the Department for Business, Energy and Industrial Strategy (BEIS) Heat Networks Delivery

Unit (HNDU). The Heat Network Investment Project (HNIP) approved the Council's application for capital grant towards the construction of the heat network and grant for the commercialisation of the SPCHN. A revised application to HNIP is under preparation to increase the capital grant for the heat network to reflect changes in market conditions facing many heat projects as a result of Brexit and the pandemic. The Cambridgeshire and Peterborough Combined Authority (CPCA) contributed match funding in the early phase of the project towards costs for drafting the community Heat Supply Agreement and for heat meter installations into homes to access real data.

2.1.6 Planning permission for the project was secured on 24th November 2020 and a Stage 1 application for Renewable Heat Incentive (RHI) was submitted on 30th November 2020 – to lock in the existing tariff values for both ground source and air source heat pumps. The SPCHN project is now waiting for Ofgem to invite it to submit a Stage 2 application and provide evidence of an investment decision/financial close to be eligible for the RHI. The financial close must be externally audited, and this must be provided to Ofgem with the stage 2 submission. Once approved the SPCHN must deliver construction of the project by 31<sup>st</sup> March 2022 and have started delivering heat to homes.

2.2 A set of high-level principles have guided the development of the Project.

2.2.1 The principles set out below have guided the development and design of the project by putting the consumer at the heart of the solution:

- Net-zero carbon emissions reduction for heating and hot water for participants;
- No cost barrier to join the scheme at the start of the project\*. This provides an opportunity for all households on oil in the village to participate - an equitable solution for everyone, not just those able to pay up front;
- Low carbon heating solution that is more cost effective than existing oil boilers and tanks\*\*;
- A quality assured heat supply service, delivered by a single contractor (Design, Build Operate and Maintain (DBOM)) to ensure performance risk is managed by experts; and
- A project that can be replicated elsewhere for other off-gas communities.

\* If homes join post-construction a fee will be charged to cover connection costs.

\*\* Oil prices pre-Covid 19.

2.3 What are the heating and hot water options for oil dependent communities?

2.3.1 The main options include:

- Individual Air Source/Ground Source Heat Pumps for every home;
- District heating networks with renewable energy for the community; or
- Biomass boilers for individual homes (The detailed comparative costs are not included for individual biomass boilers as biomass supplies and air pollution make this option less attractive than the first two options.)

2.3.2 Comparing the costs of the SPCHN project versus ‘do nothing’ (remain with oil boilers) or investing in individual Air Source Heat Pumps (ASHPs) into all homes across the village, the cost is significantly less with the proposed community district heating scheme over the lifetime of the project. Please see Table 1: Extract: Net Present Value (NPV) impact summary below. Over 60 years, the SPCHN would provide energy more cheaply than the ‘do nothing’ oil counterfactual, while also achieving a large carbon reduction and improving air quality. The SPCHN is also significantly less costly than individual ASHPs for each household and has a number of other advantages as well, e.g.

- higher expected take-up as a result of no required capital contribution by the household;
- the single point of demand for additional electricity means it will be easier to manage any required grid upgrade;
- low-carbon electricity is sourced reducing future CO2 emissions significantly more than individual ASHPs; and
- has built-in redundancy to provide better security of continued heat production than individual ASHPs.

Table 1: Extract : Net Present Value (NPV) impact summary vs counterfactuals

| SPCHN  | Oil comparator | Individual ASHP for every home comparator |                                |
|--------|----------------|---|--------------------------------|
| £12.1m | £16.9m         | £21.4m                                    | Cost to householders           |
| £2.8m  | £0             | £1.6m                                     | Cost to central government     |
| £14.9m | £16.9m         | £23.0m                                    | Total cost                     |
| 79k    | 0              | 72k                                       | Tonnes of carbon saved to 2081 |

## 2.4 Investment Case for the Project.

2.4.1 The proposed commercial structure for the project is set out in Appendix D and is informed by government finance incentives, grants and state aid compliance. The overall finances for the project, in net present value terms, are as follows:

|                                      | <b>£'000</b>   |
|--------------------------------------|----------------|
| Build cost - Energy Centre           | 4,589          |
| Build cost - Heat Network            | 4,436          |
| Grid connection costs                | 1,819          |
| CCC costs                            | 539            |
| Contingency                          | 570            |
| HNIP Grant Funding (assumed)         | -2,833         |
| <b>CAPITAL BORROWING REQUIREMENT</b> | <b>9,120</b>   |
| <br>                                 |                |
| Heat Purchase Agreements             | -10,484        |
| Carbon credits and CCL               | -6,850         |
| Renewable Heat Incentive             | -2,697         |
| <b>TOTAL REVENUE (NPV)</b>           | <b>-20,031</b> |

|                               |               |
|-------------------------------|---------------|
| Operation and maintenance     | 2,210         |
| Energy costs*                 | 2,490         |
| SPV and site costs            | 2,310         |
| Lifecycle costs               | 1,284         |
| Total loan costs              | 10,750        |
| <b>TOTAL COSTS (NPV)</b>      | <b>19,044</b> |
| <br>                          |               |
| <b>TOTAL NET INCOME (NPV)</b> | <b>-987</b>   |

\*Based on assumed supplies at wholesale price from North Angle Solar Farm.

2.4.2 The total capital cost of the project is £11.9 million including contingency. HNIP grant totalling £2.8m has been assumed towards the cost of the construction of the heat network as set out above. The residual cost to be funded by Council borrowing would be £9.1m and the anticipated return on this investment is set out in the following table:

**Outputs before and after HNIP grant**

|                  | Before grant | After grant |
|------------------|--------------|-------------|
| IRR              | 3.83%        | 5.03%       |
| Annual Net Yield | 6.29%        | 8.42%       |
| NPV              | -£2,351,585  | £987,299    |
| Payback (years)  | 31.3         | 24.5        |

2.4.3 The pre-intervention and post-intervention financial outputs in the above table show the comparative financial returns, excluding and including HNIP grant funding, over a 60-year period (the minimum expected life of the heat network). Assuming the £2.8m of grant funding is secured, the project is expected to generate an average annual net yield of 8.42%, with a payback period of 24.5 years and Net Present Value (NPV) of £1.0m.

2.4.4 Across such a long period this level of NPV is very small and the proposed business case would not be attractive as a purely commercial investment. However, as members have already agreed, the primary motivation for the project is not commercial, but to deliver substantial social and environmental benefits – not just relating to carbon savings, but also cleaner air and fuel poverty prevention. The Social Value of air pollution savings, which are not currently included in the business case, would be £0.8m. The Social Value of carbon reductions would also be slightly higher (£0.3m) than the financial value of the intended sale of carbon credits already included in the business case.

2.4.5 The overall project will be split into two parts. The Energy Centre will produce the energy required and will be directly under the control of the Council, though detailed operations will be carried out by Bouygues as part of the DBOM contract. This element will be fully financed from Public Works Loan Board (PWL) borrowing by the Council. In March 2019 the Council submitted a successful bid to the Treasury to borrow over £60m at the Local Infrastructure Rate (LIR) for energy investment projects. The anticipated financial returns for the project assume that the Council can secure LIR borrowing at a rate of 1.39% - that's the current market rate, though that is subject to change up to the point a loan is actually taken out.

2.4.6 The other element of the project will be to set up a Special Purpose Vehicle (SPV) to construct and maintain the heat network of pipes between the Energy Centre and individual homes and businesses. The use of an SPV is a requirement to receive the HNIP grant, which will part-fund the cost. CCC will provide the finance for the remaining cost, but the exact

details of how this will be done will depend on the rules that replace the state aid requirements that previously applied under the EU. Government has not yet clarified how the new rules will work.

2.4.7 The project is benefiting from a commercialisation grant of £355k from HNIP, in addition to the grant supporting capital costs. The commercialisation grant is specifically to facilitate the setup of the heat network and the Council will need to pick up any costs purely associated with the energy centre. The type and value of costs to be covered by the grant is still subject to final determination but based on current projections it's possible that up to £40,000 of costs that were originally intended to be covered by this grant will not be eligible. Such costs would then need to be covered by contingency funding.

2.4.8 Income for the Energy Centre will be generated through the following mechanisms:

- Heat sales to customers  
There are a total of around 330 potential homes and businesses and the business case assumes that at least 160 of these will wish to participate in the project initially. An outline application for 28 new homes for the village has recently been submitted to East Cambridgeshire District Council. If approved, the SPCHP will look for these homes to connect to the network. Household Surveys have running during October and November 2020 - already 90 homes have completed surveys and more will take place in 2021. It is anticipated that more than the target of 160 will be achieved. Sanctuary Housing has over forty homes in the village and is keen to participate in the project. Project and heat costs are under discussion with the Diocese of Ely that run the primary school. The pub landlords have also expressed a willingness to be involved. The business case forecasts nearly 300 homes and businesses will be connected within 5 years of commencement of heat generation.
- Renewable Heat Incentive (RHI)  
To incentivise uptake of low carbon heating solutions, the government set up the RHI for non-domestic and domestic projects. This project will access the non-domestic RHI and a Stage 1 application for Tariff Guarantee was submitted 30<sup>th</sup> November 2020. Payments under the scheme are made once construction is completed and based on the amount of energy distributed to customers.
- Carbon credits  
The project will save over 79,000 tonnes of carbon emissions over 60 years. A CUSPE 2020 research project identified the opportunity for a Cambridgeshire Decarbonisation Fund. This Fund would attract investment from businesses for carbon credits and the SPCHN will be included as a project in this Fund if it progresses. Carbon credit sales are assumed in the business model to contribute £6.8m to NPV over 60 years and this source of funding is essential to secure the viability of the business case.

2.4.9 As part of the HNIP grant conditions, the Council has signed up to The Heat Trust, and its customer service standards. In addition, the metering, billing and customer service arrangements (Retail function) is currently being developed. The intention is to run this in-house using ERP Gold linked to a data platform. The costs of these retail services are included in the project.

### 3. Investment Risks and Sensitivity Analysis

3.1 A project risk register is attached at Appendix E and provides an overview of the technical and investment risks. The key investment risks are discussed below, and Appendix F is a sensitivity analysis on how this impact the business case.

#### 3.2 Sale of carbon credits

3.2.1 The government publishes very detailed advice on how best to undertake project appraisal (the Green Book) and this advice includes values to include for carbon savings – these values have been used in our business case. However, the actual values that carbon credits can be sold for in future will depend very heavily on future political decisions about the structure of any future carbon trading scheme. As sales of carbon credits form a significant element of the total income expected in the business case, this means future performance of the project will be significantly affected by future political decisions.

3.2.2 As this is a significant risk to the project, the Council has initiated discussions with BEIS, the local MP and the relevant minister to consider ways the risk could be mitigated. That could be done for instance through influencing future government policy, or by additional grant funding aimed at reducing the level of income required from the sale of carbon credits. At present, there is no assurance these discussions will be successful. Valuing carbon reductions and identifying where this fits into new business models is strategically important. It impacts the scale and pace of achieving early carbon savings and the overall net zero by 2050 commitments. As a champion for rural communities, developing this dialogue with Government could bring support relevant for other off-gas rural villages looking to shift off oil and put together viable business cases.

#### 3.3 Availability of Renewable Heat Incentive (RHI)

3.3.1 There was a substantial increase during September and October 2020 in heat pump projects seeking RHI. As a result, the government budget for this type of scheme was exceeded and our application for RHI, submitted at the end of November, was placed in a queue to await the possibility of funding becoming available. BEIS announced on 18<sup>th</sup> December 2020 that additional budget would be made available to allow all applications already in the queue to receive funding. While there are still financial, technical and compliance requirements to receive the grant – in particular reaching financial close to submit a Stage 2 application and to have an operational project by 31<sup>st</sup> March 2022 – the change in budget available has greatly reduced the risk associated with RHI but the RHI tariff has decreased reducing substantially during the last year. The Stage 2 application requires an independent audit report to confirm that a financial investment decision has been made and funds committed to the project. This is being procured. The Stage 2 application must be made within 3 weeks of Ofgem approving the Stage 1 application and no later than 31<sup>st</sup> March 2021.

#### 3.4 Loan requirement

3.4.1 The loan requirement represents the total net initial cost of the project. This is made up of the capital cost, less grant available.

3.4.2 The capital cost of the project has increased in recent months for several reasons. In particular it has been influenced by:



- Covid-19  
The direct and indirect effects of the pandemic have put pressure on the supply chain, reducing the number of suitable suppliers to choose from and hence tending to raise quoted prices. The requirements for social distancing during construction have also had a direct impact on expected construction costs.
- Brexit  
The general uncertainty over Brexit has had an impact on recent prices tendered. Administrative costs associated with customs declarations and exchange rate risk have increased recent prices tendered.
- RHI timetable  
As noted above, the project must be operational by the end of March 2022 to qualify for RHI. This is a tight timetable for a complex project and, in order to reduce the risk of project delays, some decisions have been taken that result in increased costs. For instance, the route taken for the trenches that will hold the heat network pipes will now be along public highways. The costs of 'hard-dig' are greater than the alternative 'soft-dig' across privately owned fields, but avoid the potential delays associated with negotiating access rights.

3.4.3 While the current business case is based on tendered prices, these are not yet final figures and it is possible that capital costs will change further until we have received the final Investment Grade Proposal from Bouygues.

Table 2: Indicative timeline for the SPCHN Project

| Activities/Timeline  | Feb 2021 | March 2021 | April 2021 | September 2020 | March 2022 | March 2022-2025 |
|--|----------|------------|------------|----------------|------------|-----------------|
| Finalise all costs resulting from Brexit and Covid impacts |          |            |            |                |            |                 |
| Finalise RHI and HNIP grants                               |          |            |            |                |            |                 |
| Finalise and sign DBOM contracts                           |          |            |            |                |            |                 |
| Project Mobilisation                                       |          |            |            |                |            |                 |
| Construction of heat network and energy centre             |          |            |            |                |            |                 |
| Customer connections Phase 1                               |          |            |            |                |            |                 |
| Customer connections Phases 2-5                            |          |            |            |                |            |                 |

3.4.4 The other element to the loan required is grant funding. HNIP have already offered us a grant of £1.8m towards the costs of construction, but we are in the process of applying for an increase of £1.0m to this grant to recognise the increased capital costs referred to above. While responses from HNIP have been positive so far, and they have recently formally agreed a methodology to consider requests for additional funding, no additional funding can be guaranteed at this point. The business case assumes that HNIP will provide all the additional funding requested.

### 3.5 Connection to North Angle Solar Farm

3.5.1 Commercial and Investment Committee recently approved in principle the business case for the proposed North Angle solar farm near Soham. This proposal included supplying Swaffham Prior with electricity at the equivalent wholesale price supplied to the Grid (£0.05/kWh). The SPCHN business case includes the costs for a private wire connection to the North Angle Solar Farm but if for any reason this is not possible, the SPCHN planning application included for a small solar park near the energy centre to offset electricity costs and deliver green electricity directly to the project. The latter would provide a substantially lesser proportion of the energy centre's electricity demand compared with the North Angle Solar Farm, but the additional demand would be purchased on a green tariff at retail price (around £0.12/kWh). Although there would be a considerable capital cost saving, there would still be a net negative impact on the business case.

### 3.6 Starting tariff

3.6.1 The business case assumes that the cost of heat supplied to householders would be set at a level equal to the cost of oil at the point householders are required to sign up. The projected cost of oil is currently taken as the BEIS price projection for 2021, but actual prices could potentially vary considerably – for instance as a result of the economic impact of Covid-19 restrictions.

### 3.7 Number of customers signing up

3.7.1 The impact of small variations in the number of customers signing up is marginal. However, there is limited ability to scale the size of the Energy Centre and heat network. That means that, if customers fall below the initial target number of 160, it would not be possible to reduce the costs to reflect the lower numbers and the impact of such lower numbers would then be much more significant.

## 4. Alignment with corporate priorities

### 4.1 A good quality of life for everyone

Fuel for heating and hot water is a significant cost for householders dependent on oil and an increasing fuel poverty concern. This project has been designed to help manage future fuel costs and offer the community better environmental choices for heating and hot water than oil, a fossil fuel. The benefits of shifting off oil onto renewables also include local air quality improvements.

In addition, approximately 30 organisations most of which are local are involved in the design, development and future construction of the SPCHN project. It is important that projects like

this can secure jobs and support the supply chain as the County moves towards a green recovery from the Covid-19 pandemic.

## 4.2 Thriving places for people to live

Cambridgeshire is a predominantly rural County with a large network of villages. Many of our villages are reliant on oil for heating and hot water, systems that are not fit for the future in a low carbon world. This project will lead by example, share its learning with others and support other oil dependent communities to shift off oil.

## 4.3 The best start for Cambridgeshire's children

Swaffham Prior school children have been directly involved in the project. During science week in 2019 the school input to making a video shared in paragraph 1.4 on how a heat pump works and projected an image of the borehole drilling onto the side of the school wall for everyone to see what was happening on site in July 2019, but at a safe distance. The impacts of climate change will be felt most keenly by future generations and developing projects now that use clean energy supplied locally is positive learning for our communities.

## 4.4 Net zero carbon emissions for Cambridgeshire by 2050

Cambridgeshire's carbon emissions in 2017 reached 6.1million tonnes per annum plus peatland emissions of 5.5Mt/CO<sub>2</sub> per annum. This project is forecast to reduce annual emissions in Swaffham Prior by 1,338 tonnes per annum when connections reach 90% of the village. 53,000 tonnes of carbon emissions are forecast to be saved over 40 years. For Cambridgeshire to deliver net-zero by 2050 all buildings across Cambridgeshire will need to reduce carbon emissions to net-zero. Tackling the more polluting homes dependent on oil stops further carbon emissions sooner rather than later.

# 5. Significant Implications

## 5.1 Resource Implications

Section 2.4 sets out the project's outline business case. The Energy Investment Unit staff costs (including finance support) for the development of the project has been partly covered by the transformation fund agreed in May 2019 and with the remaining costs included in the total project capital costs. For further community heat projects like this, dedicated project management support will be required. It is also important to note that the rural estate land for the energy centre is integral to the Swaffham Prior project business case and the rural estates team have also supported the project development.

## 5.2 Procurement/Contractual/Council Contract Procedure Rules Implications

The Council appointed Bouygues Energies and Services Solutions Ltd in November 2017 as a result of a mini competition under the Refit 3 Framework. It is this procurement that has been used to develop the project.

The Rural Estates team have liaised with the tenant farmer for Goodwin Farm regarding the land earmarked for the energy centre and ongoing access to the land for the development of the project. The Swaffham Prior Board has also met the tenant farmer and the tenant is supportive of the project. The existing barn on the land is planned to host the new energy

centre and a new equivalent barn, will be built in a location agreed between the Council and the tenant. This cost is included in the outline business case.

### 5.3 Statutory, Legal and Risk Implications

The investment and project risks are set out in section 3 above and the accompanying risk register in Appendix E.

### 5.4 Equality and Diversity Implications

Please see section 2.1 describing the strategic purposes of the project and offering access to all in the village.

### 5.5 Engagement and Communications Implications

BEIS Heat Network Delivery Unit (HNDU) grant has helped to fund community engagement for the village recognising that the community and its residents are crucial to the project's success. Last year 166 homes agreed in principle to sign up to the project and further work is planned to engage the community during the next few months to confirm this commitment.

Four community presentations have been held in the village hall to report project progress, along with drop-in sessions such as a 'techy' walk for those more interested in the engineering design details, attendance at village events and working with the school. A session with residents in the local pub also examined a model heat agreement to identify and understand residents' concerns over signing up for heat sales.

An information booklet was shared with the village in 2019 and ongoing news is posted on the project website. Facebook posts, newsletters, school magazines and articles in the local Crier magazine have also been published during the year, as well as items on TV (Look East, July 2019), radio interviews and local newspapers.

### 5.6 Localism and Local Member Involvement

Progress updates have been provided to the Swaffham Prior Parish Council meetings and to the Local Councillors.

### 5.7 Public Health Implications

Air quality monitoring: There are two schemes to measure air quality underway with the project. The first is with East Cambridgeshire District Council, where a number of diffusion tubes have been set up across the village to monitor NO<sub>x</sub> and background emissions. This data will be provided monthly and is a high-level indication of pollutants. A more detailed, granular level of monitoring was installed in July 2020 to monitor particulates and NO<sub>x</sub> in strategic locations in the village. Air quality is being measured to provide evidence for the emissions reduction as a result of the project, to inform Public Health, future CUSPE research proposals as well as providing insights for post Covid -19 air quality emissions, lifting of lockdown and implementation of the heat project.

Have the resource implications been cleared by Finance?

Yes

Name of Financial Officer: Matthew Rathbone

Have the procurement/contractual/ Council Contract Procedure Rules implications been cleared by the LGSS Head of Procurement?

Yes

Name of Officer: Gus de Silva

Has the impact on statutory, legal and risk implications been cleared by the Council's Monitoring Officer or LGSS Law?

Yes

Name of Legal Officer: Fiona MacMillan

Have the equality and diversity implications been cleared by your Service Contact? Yes

Name of Officer: Elsa Evans

Have any engagement and communication implications been cleared by Communications?

Yes or No

Name of Officer:

Have any localism and Local Member involvement issues been cleared by your Service Contact?

Yes

Name of Officer: Emma Fitch

Have any Public Health implications been cleared by Public Health?

Yes or No

Name of Officer: Iain Green

## 6. Source Documents

### Documents

- [Swaffham Prior Community Heat Project, Committee Report, November 2018](#)
- [Commercial and Investment Committee paper, 22<sup>nd</sup> May 2020 on the outline business Case for Swaffham Prior Community Heat Project.](#)
- [Heating Swaffham Prior Community website – updates and newsletters](#)
- [Swaffham Prior Community Heat Project – Information Booklet](#)
- [Heating Swaffham Prior video](#)

### Internal files

- Round 9 BEIS HNDU application for Detailed Project Development, October 2019
- HNIP application, April 2020, including Finance and Energy Modelling
- Financial model (FEAMv014)

Swaffham Prior Community Heat Project



Heat Network  
 Borehole Field  
 Energy Centre (heat pumps)  
 Solar Power Plant



Sketch of the Energy Centre and Air Source Heat Collectors and Expansion vessels



The HIU fits into a kitchen cupboard. It may replace an existing boiler and water heater, or these may be retained in addition to the HIU.

The HIU performs a number of functions, it:

- Transfers heat from the network to water
- Establishes the boundary between 'the network' and your home
- Removes the need for hot water storage
- Measures energy usage through an integrated meter

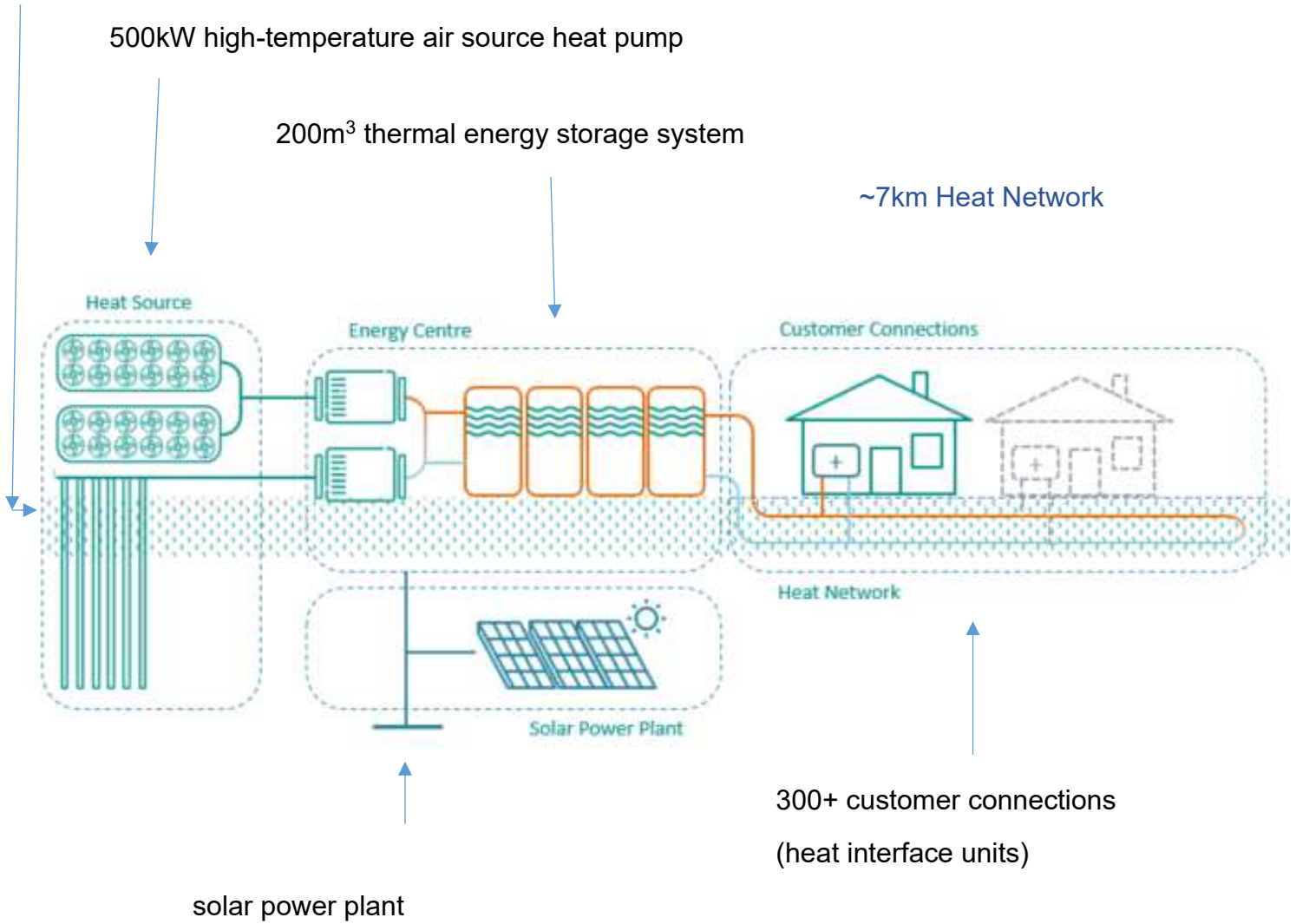
### Schematic of the Swaffham Prior Community Heat Project

1,600kW high-temperature ground source heat pump  
130x 200m boreholes

500kW high-temperature air source heat pump

200m<sup>3</sup> thermal energy storage system

~7km Heat Network



## Summary of the Project Development and deliverables to date

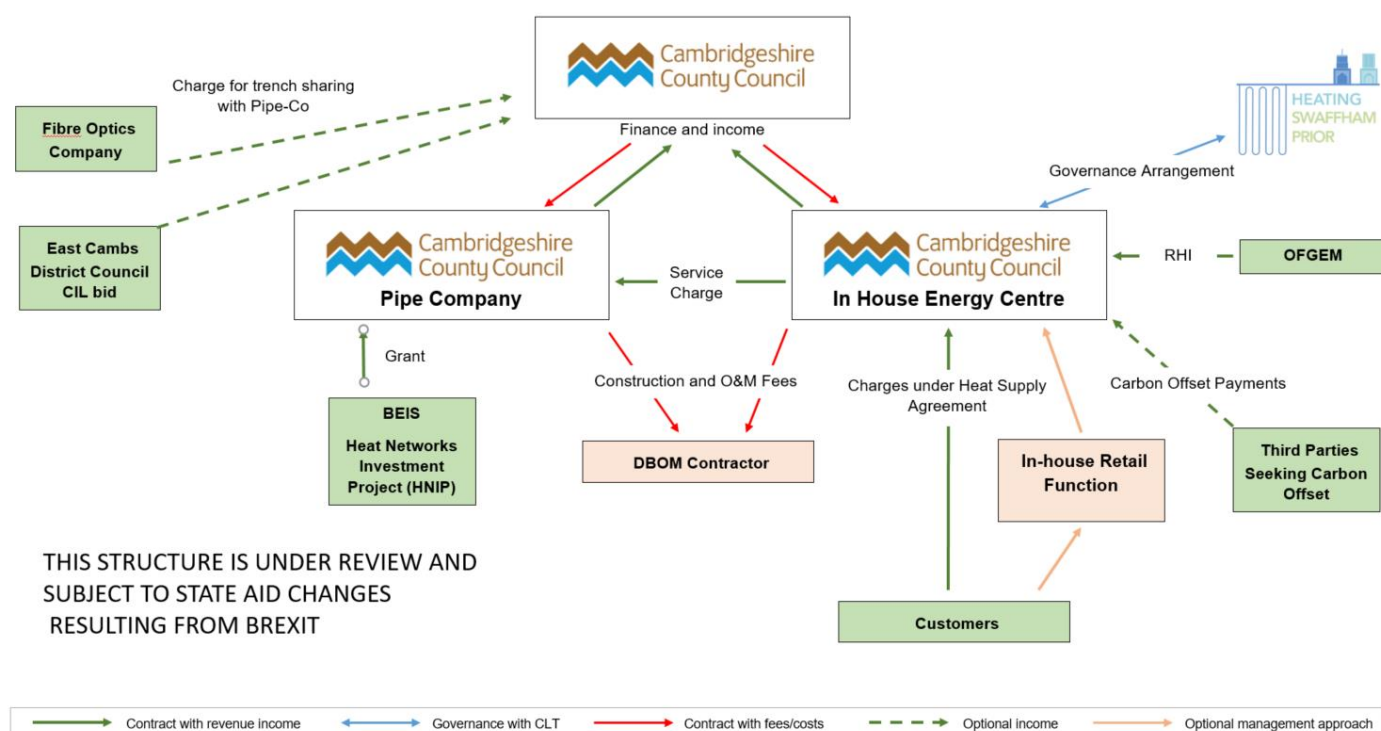
| Project Phase                    | Grant (£)   | Match Funding (£) | Total (£)      | Key deliverables  |
|----------------------------------|---|-------------------|----------------|---|
| High level Feasibility           | 20,000<br>Waste and Resources Action Programme (WRAP) | -                 | 20,000         | Identification of two community heat project options for Swaffham Prior village   |
| Techno-economic modelling        | 40,200<br>BEIS HNDU                                   | 20,000<br>(CPCA)  | 60,200         | Options appraisal of key technologies<br>Techno-economic model for preferred technology option<br>A draft Heat Agreement for customers<br>Installation of seven heat meters to measure distribution and level of consumption  |
| Detailed Project Development - 1 | 100,300<br>BEIS HNDU                                  | 29,700<br>(CCC)   | 130,000        | 200m borehole planned and drilled to assess heat availability for ground source heat pump<br>166 homes signed up to be part of the heat project as an anchor load<br>Detailed design work for energy centre and heat network to RIBA stage 2<br>Updated techno-economic model to reflect new designs, technologies, better data and soft market testing |
| Detailed Project Development - 2 | 232,000<br>BEIS HNDU                                  | 66,000<br>(CCC)   | 298,000        | Scheme design, EIA scoping and development and submission of the planning application<br>developed and submitted<br>Commercial structure designed<br>Funding – Heat Network Improvement Project (HNIP) incl outline business case<br>Income identification<br>Risk management   |
| <b>TOTAL</b>                     | <b>392,500</b>  | <b>115,700</b>    | <b>508,200</b> |   |



|                                      |                                     |                    |           |   |
|--------------------------------------|-------------------------------------|--------------------|-----------|---|
| Commercialisation                    | 355,000<br>(HNIP)                   | -                  | 355,000   | <p>Current Phase</p> <p>Set up of commercial structure</p> <p>Final scheme designs</p> <p>Archaeology and other planning conditions inform final scheme designs and final business case</p> <p>Household Surveys to identify heat loads and network connections – 90 completed</p> <p>Procurement strategy</p> <p>Investment Grade Proposal - finalisation</p> <p>RHI Stage 1 Application - completed</p> <p>RHI Stage 2 Application (Ofgem) confirm stage 1 application and invite stage 2 application)</p> <p>Set up retail function and sales strategy- underway</p> <p>Best value reviews by Local Partnership – scheduled February 2021</p> <p>Heat Agreements with customers – contract agreed and sign ups start after investment decision</p> <p>Finalise DBOM contracts - underway</p> |
| Construction – District Heat Network | Capital grant<br>2,799,065<br>(TBC) | 1,637,092<br>(CCC) | 4,436,157 | On finalisation HNIP grant - Notice to Proceed and mobilisation of project. Capital investment into the heat network by the Council.  |
| Construction – Energy Centre         | -                                   | 4,589,462<br>(CCC) | 4,589,462 | Capital investment by the Council to draw down Revenue income estimates 2,697,000 from the RHI  |

## Commercial structure of the Project

The preferred commercial structure for the project is set out below in diagram 1.



*The Pipe Company* will be responsible for installing and maintaining the heat distribution network and heat interface connections with customer properties; these are the elements of the project that are eligible for HNIP grant funding. The HNIP funding conditions dictate that local authority-controlled projects must be held off the National Accounts which requires the establishment of a Special Purpose Vehicle (SPV), such as a Council-owned limited company. The Pipe Company will be financed by grants from the Company and the Council will generate income to pay operational costs via the Service Charge.

*The in-house Energy Centre* will generate renewable heat for distribution to the community via the heat network. Heat Purchase Agreements will be established between customers and the Energy Centre under the legal powers set out below. Keeping the Energy Centre in-house satisfies state aid restrictions on borrowing for commercial projects at below-market rates.

**Government Powers and State aid:** Under the Local Government Act 1976 s.11 the Council has the powers to design, construct, operate and maintain an energy centre to generate renewable heat; supply and bill customers for the heat and to lay district heating networks. These 'powers' allow the Council to invest directly into the energy centre for the provision and sale of heat to customers and to access the Renewable Heat Incentive (RHI), on a no aid basis (although review is still being taken to confirm the availability of RHI more generally).

The LGA 1976 powers also apply for investment into the heat network. However, we note that as a matter of a requirement for HNIP purposes, a Special Purpose Vehicle must be set up, a Pipe Company, and the Council must pass any grant directly to the company, for no aid to apply. This is particularly relevant for the project as an application for grant submitted to the Heat Network investment Project (HNIP) in April requested 50% grant towards the network costs. The proposed commercial structure for the project has been tested and found acceptable to HNIP (subject to any final questions they may raise). Although this will be re-examined in further detail following the Commercialisation Phase.

**Selling heat:** The powers conferred to the Council through the Local Government Act 1976, s11 mean that it can sell heat directly to customers. The billing and metering arrangements can be set up in-house or sub-contracted.

**Governance:** Originally, the project was conceived as a joint venture between The Swaffham Prior Community Land Trust and the Council. With the identification of the LGA 1976 powers, the proposed structure has moved away from a joint venture, to one where the SPCLT exerts influence by sitting on the project board. The community representatives on the project Board have requested a covenant or something similar to be applied to the project to protect its interest in the project, should the Council decide to sell the project at a future point in time. Although a sale is unlikely, this issue is important to the SPCLT members.

**Contracting:** The Project will need to put in place a range of contracts. Since the Pipe Company and Energy Centre are distinct corporate entities, both will contract with the Design, Build, Operate and Maintain Contractor (Bouygues Energies and Services Solutions Ltd). Both the PipeCo and Energy Centre will be democratically accountable to the Council as Council owned and Council operated entities respectively.

Other contracts include:

| <b>Contract</b>  | <b>Parties</b>  | <b>Progress</b>   |
|--|---|---|
| Heat Supply Agreement (including connection letter) – both domestic and non-domestic | Council and Customers   | Consultation with residents completed. Has now finalised and awaiting final tariff. |
| Governance agreement   | Council/SPCLT   | First draft.  |
| HNIP Grant   | HNIP/Council  | First HNIP grant agreement secured.   |
| Grant  | Council and Pipe Co. This will need to be provided to the Pipe Co for the remainder of the money to construct the distribution network. | To be started.  |
| Design, Build, Operate and Maintain (DBOM)- Energy Centre                            | Council and Bouygues E&S  | Detailed negotiations completed.  |
| DBOM- Heat Network   | Pipe Co. and Bouygues E&S   | As above.   |
| Interface Agreement  | Agreement between the Council and the Pipe Co. for the management of Bouygues.  | To be started.  |
| Service Contract   | Council and Pipe Co.  | HNIP commercialisation  |

|                              |   |                   |
|------------------------------|---|-------------------|
| Third party Income Contracts | Council and third parties– e.g. Fibre Optics Company, CIL and Carbon credits ( see structure above) | Work is underway. |
|------------------------------|---|-------------------|

Project Risk Register – see excel spreadsheet

## Sensitivity of business case to changes in assumptions

| Major areas affecting results | Base case assumptions                   | Sensitivity adjustment                 |
|-------------------------------|---|--|
| Sale of carbon credits        | Sell at Green Book traded price         | Sell at 50% of Green Book traded price |
| RHI funding                   | Full funding claimed available          | No RHI funding available               |
| Initial loan requirement      | Capital cost £11.9m; HNIP grant £2.8m   | Increase required loan by £1m          |
| Electricity supply            | Supply from NASF at £0.05/kWh           | Supply from local Grid at £0.12/kWh    |
| Starting tariff               | BEIS predicted oil price of £0.053/kWh  | Reduce price by £0.005/kWh             |
| Homes connecting              | Initial 198, rising to 297 over 4 years | Reduce connections by 5%               |
| Operational costs             | Total costs £131k in first year         | Base case + 10%                        |
| Loan interest rate            | 1.39%                                   | Add 0.2%                               |
| Inflation                     | 2.75% RPI, 2.00% CPI                    | 3.75% RPI, 3.00% CPI                   |
| Discount rate                 | 4.62% (social discount rate)            | 3.42% (commercial discount rate)       |

|                  | Base Case | Carbon credits | RHI funding | Loan requirement | Electricity supply | Starting tariff |
|------------------|-----------|----------------|-------------|------------------|--------------------|-----------------|
| IRR              | 5.03%     | 3.46%          | 3.99%       | 4.55%            | 4.15%              | 4.73%           |
| Average Cashflow | 8.42%     | 4.95%          | 7.64%       | 7.53%            | 7.06%              | 7.91%           |
| NPV              | £987,299  | -£2,219,970    | -£1,710,069 | -£191,452        | -£890,809          | £271,193        |
| Payback (years)  | 24.5      | 31.4           | 32.1        | 27.0             | 30.7               | 26.2            |

|                  | Base Case | Homes connecting | Operational Costs | Loan interest rate | Inflation rate | Discount rate |
|------------------|-----------|------------------|-------------------|--------------------|----------------|---------------|
| IRR              | 5.03%     | 4.99%            | 4.79%             | 4.93%              | 6.18%          | 5.03%         |
| Average Cashflow | 8.42%     | 8.37%            | 7.97%             | 8.34%              | 12.79%         | 8.42%         |
| NPV              | £987,299  | £906,535         | £409,362          | £752,742           | £1,278,301     | £4,975,844    |
| Payback (years)  | 24.5      | 24.8             | 25.9              | 25.4               | 21.4           | 24.5          |